MUSCATATUCK NWR NARRATIVE REPORT 1971

NARRATIVE REPORT
MUSCATATUCK NATIONAL WILDLIFE REFUGE
1971
DEPARTMENT OF THE INTERIOR
BUREAU OF SPORT FISHERIES AND WILDLIFE
MUSCATATUCK NATIONAL WILDLIFE REFUGE
SEYMOUR, INDIANA

RbE RGFUGE

INDIANA BAT

3-1750
Form N
(Rev. March 1953)

WATERFOWL

REFUGE Muscatatuck NWR MONTHS OF Sept. 1 TO Dec. 31, 1971

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada				6	16	16	37	37		
Cackling										
Brant										
White-fronted										
Snow										
Blue								2	2	2
Other										
Ducks:										
Mallard	3	40	40	50	50	80	100	110	130	180
Black			6	6	10	12	15	15	20	30
Gadwall										
Baldpate					6	10	20	20	25	40
Pintail						4	4	4	4	10
Green-winged teal			10	5	15	10	10	10	10	15
Blue-winged teal	12	80	90	70	60	70	70	70	60	15
Cinnamon teal										
Shoveler				4	4	6	6	6	6	6
Wood	650	650	600	600	600	600	500	500	500	400
Redhead										
Ring-necked										15
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coot:			20	20	20	20	25	30	40	50

Int. Dup. Sec., Wash., D.C. 37944

3-1750a
Cor. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Muscatatuck N.W.R. MONTHS OF September 1 TO December 31, 1971

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production	
	11	12	13	14	15	16	17	18		Broods seen	Estimated total
Swans:											
Whistling		14	14	14	8	8	8	8	518		
Trumpeter											
Geese:											
Canada	1	1	1	1	1	1	1	1	840		
Cackling											
Brant											
White-fronted											
Snow											
Blue	2	2	2	2	2	2	2	2	154		
Other											
Ducks:											
Mallard	180	250	250	350	350	350	350	400	22,834		
Black	30	60	60	75	75	75	75	100	4,634		
Gadwall	10	20	20	30	20	10	10	10	1,036		
Baldpate	60	75	75	50	50	20	20	10	3,297		
Pintail	20	25	25	10	10				812		
Green-winged teal	10	10	10	50	30				1,330		
Blue-winged teal	10								4,249		
Cinnamon teal											
Shoveler									266		
Wood	400	400	400	400	200	150	150	50	54,250		
Redhead	12								84		
Ring-necked									105		
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coots:	50	50	50	20	20	10	10	10	3,135		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	518	14	0
Geese	994	37	0
Ducks	92,897	965	0
Coots	3,135	50	0

SUMMARY

Principal feeding areas ~~Shorebird areas~~

Principal nesting areas

Reported by

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1751
Form NR-..
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Muscatatuck NWR Months of September 1 to December 31 1971

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Sandhill cranes	26	11-5-71	250	12-4-71	65	12-17-71		0	0	400
American egret	1	9-17-71	1	9-17-71	1	9-17-71		0	0	1
Green Heron	5	9-4-71	25	9-27-71	1	10-1-71		0	0	80
Great Blue Heron	4	1-5-71	5	9-21-71	1	12-16-71		0	0	5
II. Shorebirds, Gulls and Terns:										
Wilson Snipe	12	9-22-71	12	9-22-71	1	12-17-71		0	0	350
Sora Rail	1	9-15-71	1	9-15-71	1	9-15-71		0	0	30
Greater yellowlegs	8	9-22-71	30	9-29-71	30	9-29-71		0	0	60
Herring gull	1	9-18-71	1	9-18-71	1	9-18-71		0	0	1
Kill deer	10	9-2-71	35	10-15-71	2	12-1-71		0	0	350

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:										
Mourning dove	10	9-2-71	300	11-5-71	20	12-29-71	0	0	0	8,000
White-winged dove										
IV. Predaceous Birds:										
Golden eagle										
Duck hawk	1	12-10-71	1	12-10-71	1	12-10-71	0	0	0	30
Horned owl										
Magpie										
Raven	1	9-6-71	30	11-10-71	6	12-30-71	0	0	0	200
Crow										

Reported by.....

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1750c
Form NR-1C
(Sept. 1960)

Waterfowl Hunter Kill Survey

Refuge [redacted]

Year 19[illegible]71

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est.No. Hunters	(9) Est. Total Kill
			(THE REFUGE IS CLOSED TO WATERFOWL HUNTING)					

(over)

INSTRUCTIONS

(1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.

(2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.

(3) Record the total number of hours the hunters spent hunting on the refuge.

(4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).

(5) Record total numbers of waterfowl bagged.

(6) Record total numbers of waterfowl reported knocked down but not recovered.

(7) Total of Columns 5 and 6.

(8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).

(9) Kill sample projected to 100 percent. Column 9 = $\frac{\text{Column 8}}{\text{Column 2}}$ x Column 7.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Muscatatuck NWR Months of Sept. 1 to Dec. 31, 1971

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob White Quail	6,000 acres of forest edge green legume agricultural fields and reverting agricultural lands		not enough data				NA	NA	400	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts,etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-[illegible]3
Form NR-3
(June 1945)

BIG GAME

Refuge Muscatatuck NWR Calendar Year 1971

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White tail deer	6,000 wood bottomland and upland hardwood	30	NA	NA	NA	NA	Not enough data			NA		120	120	

Remarks: Survey method, casual observations and hikes over snow observed tracks.

Reported by _____

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each</u> <u>species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1755
For[illegible]NR-5

DISEASE

Refuge Muscatatuck NWR Year 19 71

Botulism

Period of outbreak _____

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Condition of vegetation and invertebrate life _____

Remarks ~~No disease was observed~~

Lead Poisoning or other Disease

Kind of disease _____

Species affected _____

Number Affected Species	Actual Count	Estimated

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

INT.-DUP., D.C.- 53818-59

3-1757
Form NR-7
(Rev. June 1960)

(1)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge Muscatatuck Year 1971

	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
Species	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Total acreage planted:
Marsh and aquatic
Hedgerows, cover patches
Food strips, food patches
Forest plantings

Remarks: No charge was made for collecting mushrooms, persimmons or nuts. The public was given full access for this purpose. None of the above were collected for storage by refuge personnel.

3-1570
NR-8a
(4/54)

REFUGE GRAIN REPORT

Refuge Muscatatuck NWR Months of January through December, 1971

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Yellow Dent Corn	200	4,250	4,450 bu			2,500	2,500	1.950 bu		1,950	000

(8) Indicate shipping or collection points NA

(9) Grain is stored at Grain storage areas located around the Refug

(10) Remarks

*See instructions on back.

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DUP. SEC., WASH., D.C. 17065

3-1761
Form N. 1
(2/46)

TIMBER REMOVAL

Refuge Muscatatuck NWR Year 1971

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
ALL OF THE TIMBER REMOVED FROM THE MUSCATATUCK NWR DURING 1971 WAS FROM PRIVATE IN-HOLDINGS OR THAT TIMBER WHICH HAD BEEN RESERVED BY THE AGREEMENT FOR PURCHASE WITH A FORMER LAND OWNER.								

Total acreage cut over N/A Total income none

No. of units removed B. F. Method of slash disposal
Cords
Ties

INT.-DUP. SEC., WASH., D.C. 36103

3-1758
Form -8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Muscatatuck NWR County Jackson State Indiana

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return Harvested		Government's Share or Return Unharvested		Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Acres	Bu./ Tons	Acres	Bu. /Tons			
Eggeman corn	63		9				72	Grass Legume	18
Ray corn	31		10				41		
Hoevner corn	40						40	Grain Sorghum	20
Kent corn	30				2		32	Grass Legume	28
Lenz corn	45		15				60		66
McDonald corn	15		5				20		
Maschino,L. corn	20						20		
Taskey corn	15		5				20		
							305	Fallow Ag. Land.	1,000

No. of Permittees: Agricultural Operations 8 Haying Operations none Grazing Operations none

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
None				1. Cattle	None			
				2. Other	None			
				1. Total Refuge Acreage Under Cultivation				361
Hay - Wild				2. Acreage Cultivated as Service Operation				10

DIRECTIONS FOR PREPARING FORM NR--8'
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only thenumber of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvesed column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops Specify the acreage kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting

Total Refuge Acreage Under Cultivation Report total land area devoted to agricultural purposes during the year.

3-1758
Form 7-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Muscatatuck County Jennings State Indiana

Cultivated Crops Grown		Permittee's Share Harvested		Government's Share or Return Harvested		Government's Share or Return Unharvested		Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
		Acres	Bu./Tons	Acres	Bu./ Tons	Acres	Bu. /Tons			
Ray	corn	55		18				73		1
Maschino,G.	corn	48				2		50	Grass Legume	20
Juett	corn	9		3				12		
Kent	corn	30						30	Grass Legume	25
Large	corn	12				6		18		
Maschino,L.	corn	26						26	Grass Legume	23
Kasting	corn	36						36	Grass Legume	18
Monroe Gr. Sorghum		21				11		32	Grass Legume	10
Trilling	corn	20						20		96
								297	Fallow Ag. Land.	500

No. of Permittees: Agricultural Operations 9 Haying Operations None Grazing Operations None

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
None				1. Cattle	None			
				2. Other	None			
				1. Total Refuge Acreage Under Cultivation				393
Hay - Wild				2. Acreage Cultivated as Service Operation				5

DIRECTIONS FOR PREPARING FORM NR--8'
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only thenumber of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvesed column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops Specify the acreage kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting

Total Refuge Acreage Under Cultivation Report total land area devoted to agricultural purposes during the year.

Whistling swans were a new addition to the Muscatatuck National Wildlife Refuge bird list, when fourteen swans arrived on November 18, 1971.

Refuge Staff:

Left to right; Robert Nagel, Assistant Refuge Manager, Charles E. Scheffe, Refuge Manager; Larry Keck, Student Assistant; Mollie McCarty, Clerk; Edward Wagner, Biological Technician

C O N T E N T S

I. GENERAL

A. Acquisition History

Acquisition was approved by the Migratory Bird Conservation Commission on June 7, 1966. Operation was started July 1, 1967.

Year	Total Acres Acquired	Operation & Maintenance Budget
As of Dec. 31, 1967	2,000	FY-68 - $32,000
As of Dec. 31, 1968	4,000	FY-69 - 33,000
As of Dec. 31, 1969	4,305	FY-70 - 32,000
As of Dec. 31, 1970	6,000	FY-71 - 33,000
As of Dec. 31, 1971	6,552	FY-72 - 48,000

1971 was again a most significant year in the acquisition of the Muscatatuck National Wildlife Refuge. On November 1, 1971, Acting Director, John R. Langenbach, recommended to the Director that condemnation proceedings, including a Declaration of Taking, be filed against 12 of the remaining tracts of land still held in private ownership. The area thus recommended for acquisition by legal proceedings totaled 1,421.76 acres, having an estimated just compensation value of $707,700.00. The condemnation proceedings and a check for the estimated just compensation were filed on March 7, 1972.

It is the opinion of the Refuge Manager that the Bureau has done an outstanding job in real estate negotiations to reduce the number of condemnation cases to 12 of the remaining necessary tracts. Again this year, a considerable amount of the Refuge Manager's time was involved in public relations relative to land acquisition. Of tracts previously acquired, three public sales of buildings were held, and twenty-one buildings were sold to the highest bidder.

B. Habitat Conditions

1. Water

The annual spring floods occurred on schedule, with all refuge streams overflowing their banks. In July, heavy rainfall caused the streams to overflow again, resulting in serious damage to bottomland crops on the refuge. Flood control is a problem confronting refuge development, as was demonstrated in late December when another rainstorm produced flooding results. Flooding normally occurs during Spring and early Summer, but the only real criteria is rainfall of 1 inch per hour or more. Major flooding occurs when Mutton, Storm and Sandy Branch Creeks flood and the Muscatatuck River is running full.

"Heavy rainfall during any time of the year results in the streams overflowing their banks. In July, this flood damaged all bottomland crops."

2. Food and Cover

As fall migration progressed, we attempted to flood the West Shorebird marsh, which had been seeded to millet and milo. The Storm Creek water level was not sufficient for using a large pump, and the area was not completely covered by water until the flood in late December. Waterfowl response to the area was excellent, with over 1,000 mallards and blacks using the area until freeze-up in mid-January.

"Over one thousand mallards and blacks responded to flooded millet and milo on West Shorebird Marsh in late December."

Upland game continues to increase in numbers as land is acquired and habitat conditions are improved. The cutover timber, which had been sold by previous landowners, is now providing good cover and browse. A grass legume mixture seeded by permittee farmers provides nesting habitat. On eroded areas, we are planting a mixture of pine to control erosion and provide cover.

C. Weather Conditions

Precipitation

	Month	Normal	Snowfall
January	2.63	3.99	8.0
February	5.53	2.90	-
March	1.97	4.01	-
April	1.14	3.68	-
May	3.84	4.00	-
June	5.51	4.22	-
July	8.60	3.57	-
August	3.02	2.90	-
September	4.69	3.26	-
October	1.99	2.42	-
November	1.34	3.23	-
December	3.11	3.86	-
Annual Totals	43.37	42.04	8.0

Temperatures

	Maximum Temp.	Minimum Temp.
January	54	0
February	59	-7
March	70	18
April	83	26
May	88	30
June	97	52
July	93	49
August	90	50
September	92	43
October	92	34
November	79	15
December	69	14
Annual Extremes	97	-7

The weather data tabulated above were collected at the official weather station, located about five miles northwest of the Muscatatuck National Wildlife Refuge.

WILDLIFE

A. Migratory Birds

Waterfowl

Another species of waterfowl was added to the refuge list when 14 whistling swans arrived on November 18, 1971. The swans became relatively tame, and allowed many bird watchers and photographers to approach them.

"The flock of whistling swans remained on the refuge from November, 1971 to January, 1972. Many refuge visitors were able to observe these magnificent birds at close range."

After resting 16 days on the refuge, six of the swans departed on December 3, 1971. The remaining 8 swans were reduced by one in late December when one swan was killed on a pond off the refuge. Unfortunately, we were unable to determine the identity of the violator. The other 7 birds stayed until thick ice forced them to leave on January 14, 1972. Wood duck production stays below refuge potential because of inadequate brood habitat on the refuge. More migrant waterfowl use the small impoundments each year. Waterfowl use days increased from 142,289 use days in 1970 to 261,184 use days in 1971.

"Watefowl use days continue to increase. The small area kept open by compressed air on Display Pond drew in several hundred mallards and blacks for the enjoyment of wildlife observers. The Canadas, blue and snow geese are part of our display flock.

Other Waterbirds

The variety and number of refuge waterbirds continues to increase. Black-crowned night heron was a new addition to the refuge waterbird list. Great blue herons were more common this year, and many more green herons were observed.

Shorebirds

Yellowlegs, sandpipers, killdeer, and snipe continued to frequent the shorebird areas. The semipalmated plover was reported on the refuge by the Beckham Bird Club from Louisville, Ky.

Mourning doves

Mourning doves are found in good numbers throughout the year.

B. Upland Game Birds

Bobwhite quail is the only upland game bird on the refuge. This species occurs in fair numbers, and coveys were occasionally seen during the Fall.

C. Big Game Animals

White-tailed deer are the only big game animal on the refuge. The refuge has many acres of cut-over timber, and the deer are taking advantage of the excellent cover and browse. From tracks and sightings, 130 deer are estimated for the refuge. Their numbers are being held in check by illegal kills and highway mortality.

D. Fur Animals, Predators, Rodents, and Other Mammals

Small game

Each year when making year-to-year comparisons, it is necessary to take into account that the refuge has increased in size by 552 acres this year, and the refuge staff is limited in making extensive surveys. From checking hunters and casual observation, rabbit and quail populations could be considerably increased by providing more and better habitat. In order to increase game populations, the refuge is beginning to supply more year-round cover crops. This is being done to some extent by cooperative farmers. Whenever possible, the refuge share of cropland is planted

in a grass legume mixture, or the crop is left standing.

Rabbits

The cottontail rabbit population is estimated at 850 animals.

Squirrel

Squirrel hunting was not permitted on the refuge, and with this protection, the squirrel population remained in good numbers and is commonly observed by refuge visitors. The squirrel population is estimated at 2,500 animals.

Muskrat

The muskrat population along Storm Creek was somewhat decreased after an oil spill upstream of the refuge killed some of the animals. Limited trapping was conducted on dams and levees to control deterioration of these structures. Muskrat houses were left alone, as these house builders are making opening in the cattails, which permits greater duck use.

Beaver

There are very few on the refuge, but nearby lands support limited populations.

Mink

There are only a few mink on the refuge. Increases in mink numbers are not anticipated until large muskrat-filled marshes are created.

Raccoon

Raccoon are plentiful. Many of the raccoon hunters have learned that the refuge is closed to raccoon hunting; however, there were a few violations and two cases were made. The problem appears to be decreasing, as the local hunters become more aware of our enforcement policy.

Opossum

Opossum are still numerous, and road kills are frequently observed.

Predators

Feral cats and stray dogs continue to harrass wildlife. This problem is lessening as former landowners move off the refuge. Red fox occur in fair numbers, and occasional sightings are made.

E. Hawks, Eagles, Owls, Crows, Ravens and Magpies

Hawks

Most Eastern species of hawks use the refuge. It is uncommon to take a trip through the refuge without seeing two or three species of hawks.

Eagles

Eagles were not seen this year.

Owls

Two barred owls were found dead on the road. Great horned, and barred and barn owls are common on the refuge.

Crows

Crows are very common throughout the year. No roost has been found on the refuge.

Vultures

Turkey vultures are common during the summer months.

F. Birds for bird watchers

The refuge bird list has increased to 145 birds. We believe there are many bird species using the refuge that have not been recorded. When time permits, the staff will devote greater efforts toward enlarging our bird list.

G. Fish

The refuge was open to fishing from April 15 through October 1. The ice was never thick enough to permit ice fishing. Nice catches of bass, bluegill and catfish were taken early in the season.

H. Reptiles and Amphibians

At the present time, no poisonous snakes have been reported on the refuge. Some snapping turtles were removed from the refuge during pond renovation. Toads, frogs and salamanders are very numerous. Many bullfrog tadpoles are fattening in the refuge ponds. Spring peepers sing evidence to their abundance in the Spring.

I. Rare and Endangered Species

Greater Sandhill Crane

Greater Sandhill cranes migrate through the Refuge in increasing numbers each Spring and Fall. On December 4, 1971, more than 250 sandhills flew over the refuge. Many of these migrants rested on the refuge. With some habitat manipulation, more cranes could be encouraged to use the refuge. The sandhill cranes migrate over the refuge for approximately five weeks in the Spring, and seven weeks in the Fall. See photographs on following page.

Indiana Bat R+E

The leading mammalogists at Purdue University and Ball State University believe that the Indiana bat probably uses the refuge.

"The rare greater sandhill crane uses the refuge in ever increasing numbers during both spring and fall migration. Over 250 sandhills were observed flying over the refuge this fall, with many of these birds stopping to rest."

III. Refuge Development and Maintenance

A. Physical Development

No development funds were available for CY 1971. Several small flood control ponds, which also serve our wildlife and fishing programs, were constructed with S & M funds. Small repairs were made to several existing ponds and marsh areas. With considerable Green Thumb assistance, we were able to begin two additional trails and rework our one existing interpretive trail. We were unable to obtain any trail leaflets during the entire year of 1971, due to existing printing restrictions handed down from higher authority.

Water Structures

"Lake Linda", largest of the Refuge ponds, covers 5.6 acres, and was completed in April of 1971. This pond is located in the public fishing area, and we anticipate opening the pond to fishing in 1972.

"Two ponds were constructed this year. The contractors did good work, and were persuaded to place a nesting island in each pond, although original plans did not include an island."

"Lake Sheryll" was completed in September of 1971, and covers two acres. Since this pond is adjacent to three trail entrances, which will be provided with a parking lot, rest rooms and a small picnic facility, we intend to develop the pond into the interpretive program. We also intend to use this pond as a special use fishing pond.

"Green Thumb assistance was our major labor force, with tasks ranging from placing outlet pipes to surfacing trails with wood chips donated by Public Service Co. Their employment is funded by the U.S. Department of Labor, and sponsored by the National Farmers Union."

"Spring Pond" was modified by enlarging the earthen dam face which increased the water surface area from .5 acre to 1 acre.

Several existing ponds and marsh areas required improvements to maintain their water holding capacity. Two earthen dams and levees required minor repairs due to muskrat damage and general wear. In Mini Marsh, leaking of the old field tile system, which had previously been plugged, made water levels difficult to maintain. One hour's work with the small Caterpiller used in cleaning up house sites corrected the problem.

Trails

Increasing public use has warranted expansion of our one existing interpretive trail, "Wood duck Trail". A hiking trail and an interpretive trail were begun with the assistance of Green Thumb workers, who brushed the trails, built foot and tractor bridges, and spread wood chips.

"Hidden Pond Hiking Trail" will be finished after land acquisition is completed. The trail is projected to be 3.5 miles in length with a small restroom and picnic facility near the halfway point of the trail. Some interpretive media will be presented along this trail.

The other new trail is "Pine Hills Interpretive Trail" which is 1.5 miles in length. We hope to have this trail ready for use by June 1, 1972. The trail is nearly all brushed, and a foot/tractor bridge has been completed.

The existing "Wood Duck Interpretive Trail" has been re-chipped, and the old silk-screen interpretive signs have been replaced.

B. Plantings

Trees

Tree seedlings, planted with the assistance of local volunteer groups and Green Thumb workers in 1971, totaled 5,000 seedlings. Species and number planted included:

Species	Number
White pine	1,500
Virginia pine	1,000
Red pine	1,500
Bald cypress	500
Black walnut	100
Black locust	100
Tulip poplar	100
European alder	100
River birch	100
Dogwood	250
Autumn olive	250
Total	5,000

"Tree planting is primarily limited to eroded areas. Refuge manpower shortage necessitates the use of outside assistance. We employ the free services of Green Thumb workers, Scout Groups, FFA, 4-H and other student groups in conducting our tree planting program".

The trees were primarily placed on areas that had been subjected to poor agricultural practices prior to Government ownership. Approximately 8 acres of trees were planted on these areas, with the remaining trees used in landscaping our interpretive area.

Cultivated Crops

Since the refuge does not have the necessary farming equipment or staff for our own farming program, we let permitees do the farming. Overall production can be considered as average because the corn blight problem did not develop to the degree expected. Late flooding in July damaged most bottomland crops. Permittees seeded 142 acres of a grass legume mixture composed of the following:

Species	lbs./acre
Orchard grass	2
Sweet clover	5
Alsike clover	2
Ladino	1
	10 lbs./acre

We require that one cutting be made during late summer of the first year to reduce weed competition.

C. Building Removal

The removal of residences and farm buildings acquired by the refuge continues to be our most significant activity. Buildings to be removed are sold by sealed bid with the agreement for off-site removal. During 1971, a total of 8 residences and 17 farm buildings were removed in this manner. After the buildings have been removed, we do the final clean-up of the area with Green Thumb assistance. We level the basements, wells, and cisterns that remain.

IV. Field Investigation or Applied Research

A. Wood Duck Banding

Our wood duck banding quota of 250 birds was reached on September 12, 1971. Trapping began on July 8, with one walk-in trap located at both Mini Marsh and North Shorebird Marsh. The trap located on the North Shorebird Marsh was later moved to Pin Oak Pond, located behind the Refuge Manager's residence. Shelled corn was used as bait. Age and sex summary of the 250 wood ducks banded are as follows:

	Male	Female
Hatching year	90	43
Adults	84	33
Total	174	76

Some mammal interference did occur, with an occasional wood duck being lost to raccoon and mink predation. When raccoon activity became a problem, we live-trapped the animals at the banding site. The few raccoon caught were given to local conservation clubs for release on their hunting areas. We do not permit raccoon hunting on the refuge, and some of the local hunters feel resentment toward the refuge. The donation of several raccoon helped to improve relations. Mink are in low numbers on the refuge, and we were surprised to catch a young one in a live trap. This animal was given to the Ball State graduate student conducting a mammal study on the refuge.

Thirteen band recoveries were reported from the 237 wood ducks banded in 1970. States and number of recoveries in each state were Indiana (3), Georgia (4), Alabama (2), Louisiana (2), Florida (1), and North Carolina (1).

B. Dove Banding

We conducted a dove banding program on the refuge, and assisted F. Charles Kniffen, Bureau Management and Enforcement Officer, with banding 2,500 doves at Freeman Field. Refuge banding was conducted from June 30 until August 5, with a total of 95 doves being banded. Millet was used primarily as bait.

C. Mammal Study

A study of refuge mammals has been in progress the past year by Dean Huffman, graduate student at Ball State University, who is working on his Master of Science degree. This study is a continuation of the project conducted in 1969 by Gordon Reynolds, entitled "Mammals of the Muscatatuck National Wildlife Refuge". Refuge personnel have assisted in collecting specimens and have offered advice.

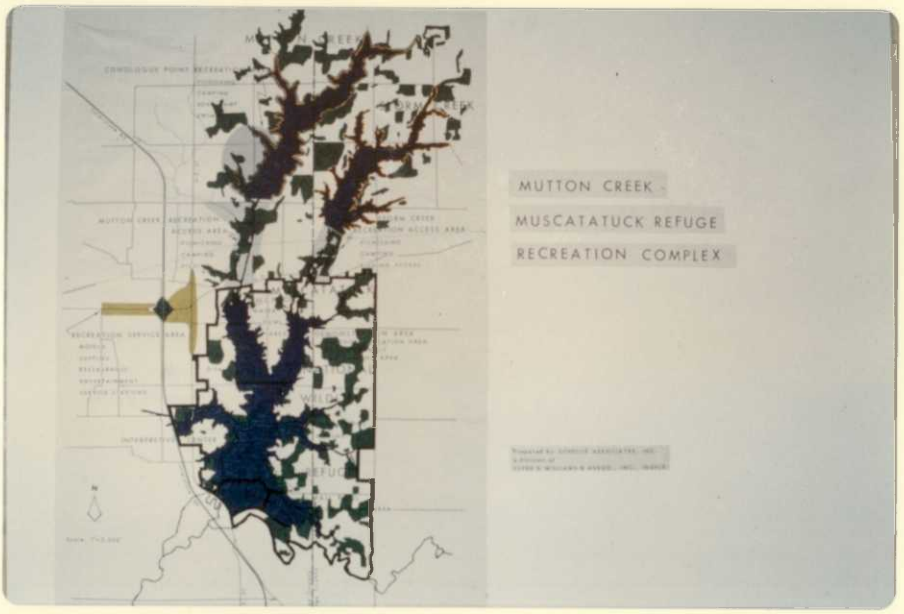
V. Public Relations

A. Recreational Use

The total estimated number of recreational visitors continued to increase from 63,947 people in 1970 to 80,120 in 1971. After land acquisition is completed in 1972, and some development is undertaken, recreational use is anticipated to increase rapidly.

"Visitor use continues to increase as local schools begin to utilize refuge facilities as an outdoor classroom."

"Ed Wagner, biological technician, demonstrates fish feeding as part of our fish management program. This pond is located along our Wood Duck Trail."



"One proposed recreational development for the Muscatatuck National Wildlife Refuge area includes two impoundments north of the refuge. These two areas would provide non-wildlife-oriented recreation."

With the cities of Indianapolis, Louisville, and Cincinnati all being within 1½ hour's drive of the refuge, the control of public recreation will be a major refuge concern in the future.

Presently, our major attractions are fishing, hunting and wildlife observation. Since fishing and hunting are nearing refuge capacity, we are directing our efforts toward increasing wildlife numbers and variety through habitat development.

"Special fishing contests are held on ponds provided for this purpose. This youth contest was well attended, and all the boys and girls managed to catch a bluegill, bass or catfish. Prizes were given for the largest, smallest and most fish caught in each age catagory."

"A local Boy Scout troop helped to renovate a pond in the morning, and then were allowed to fish at a special occasion pond. Their expressions testify to their angling ability."

V. Public Relations

B. Office Visitors

Congressman Lee H. Hamilton, 9th District
David McFall, Administrative Assistant to Congressman Hamilton
Chuck Danner, District Biologist, Ind. Dept. of Natural Resources
Jim Harrison, Project Leader, Central States Fisheries Station, Princeton, Ind.
George Armstrong, State Probation Officer
Marvin France, Executive Secretary, Vernon Forks Conservancy District
Joe Branco, Historic Hoosier Hills R C & D Project Coordinator
Louis Kowalski, Regional Office Engineer
Arden Trandahl, Regional Office Fisheries Biologist
Paul Kunz, Supervisor, Indiana Highway Commission
Dick Dickerson, S.C.S. District Conservationist, Jackson Co.
John Wolf, Chief Negotiator, Division of Realty
George Tilford, Sports Writer, Indianapolis News
Robert Dryden, S.C.S. technician, Jennings Co.
John Winship, Regional Office Pilot
Bill Jensen, Review Appraiser, Division of Realty
Herb Krauch, Extension Wildlife Biologist, Purdue University
Roger Mustonen, Regional Office Surveyor
Leroy Dennis, Regional Office Surveyor
Steve Anderson, Regional Office Surveyor
Henry Krumme, realtor, Seymour, Ind.
Chuck Moss, Central States Fisheries Station, Princeton, Ind.
Larry Sintz, Biologist, Ind. Dept. Natural Resources
Jim Gritman, Associate Regional Supervisor
Philip Morgan, Assistant Regional Supervisor
Frank Haubry, Forest Ranger, Brownstown District
F. Charles Kniffen, U.S. Game Management Agent-in-Charge, Indianapolis, Ind.
James Peterson, Associate Professor; Health, Physical Education and Recreation, Indiana and Purdue Univ.
Gerald Cummings, Wildlife Biologist, Chautauqua National Wildlife Refuge
David Turner, Refuge Manager, Monroe Reservoir

Harry McClain, Investigator, Audit Operations,
Dept. of Interior
Bill Zimmerman, free lance wildlife illustrator
James Endicott, local refuge supporter
Luveen Swanburg, Regional Office Surveyor
Larry Owens, Forester, Indiana Dept. of Natural Resources
Hannibal Bolton, Central States Fisheries Station,Biologist
Lt. Philip Ohmit, Clark State Forest
Larry Sisk, Hebron Fish Hatcheries
Clair Rollings, Staff Specialist, Regional Office
Gary Larson, Predator Control Division BSFW,
Purdue University
Bill Thomas, nature photo-journalist
Bill Sontag, Regional Office Staff Specialist,
Interpretation
James Hughes, Realty Division, Indiana Dept. of
Natural Resources
Robert Gerry, Jackson Co. Sanitarian
James Mason, Environmental Protection Agency,
Evansville, Indiana
Ron Ulrich, Environmental Protection Agency,
Evansville, Indiana
Joe Lamendola, waterfowl biologist, Indiana Dept.
of Natural Resources

V. Public Relations

C. Meetings Attended by Refuge Personnel

Date	Organization
1-14	Executive Council, Indiana Chapter of the Wildlife Society
1-14	Gene Bass, Director, Division of Fish and Wildlife, Indiana Dept. Natural Resources
1-27	Advisory Board, Indiana Green Thumb
2-1	Annual dinner, Soil & Water Conservation District, North Vernon, Ind.
2-2	Vernon Forks Conservancy District, Monthly meeting
2-12	Seymour Chamber of Commerce, Annual Meeting
2-19	Seymour Daily Tribune, Vernon Forks Conservancy District, Seymour Chamber of Commerce Recreation Committee, Co-operative meeting
3-12	American Fisheries Society - Ball State Univ.
3-24	Historic Hoosier Hills R C & D Project
4-1	Seymour Chamber of Commerce, Recreation Committee
4-29	Jennings Co. Parks & Recreation Board
5-27	Jackson Co. Chamber of Commerce, Recreatinn Committee
6-3	Jackson Co. Chamber of Commerce, Recreation Committee
7-1	Pond Demonstration, Jackson Co. Conservation Club
7-28	State Advisory Committee on Outdoor Recreation
9-10	Indiana Chapter of Wildlife Society
9-14	Jackson Co. United Fund
10-7	Jennings Co. Fair Committee

V. Public Relations

D. Programs Presented

Date	Organization	Number Attending
2-13	Jackson Co. Rock & Fossil Club	25
2-20	Hoosier Outdoor Writers' Assn.	20
2-25	Crothersville High School Ag. Dept.	45
3-16	Interested citizens	10
3-27	Indiana Chapter of Wildlife Society	200
4-1	Chairman, Workshop on White House Conference on Aging	20
4-21	White River Fish and Game Club	18
5-11	High School Class - Seymour H.S.	36
5-15	Youth Fishing Contest	101
5-22	Special fishing contest for tree planters	50
6-16	Historic Hoosier Hills R C & D Project, Versailles, Ind.	20
9-18	Fishing rodeo for Boy Scouts	20
9-30	Cub Scouts	40
10-10	Cortland Lutheran Church Youth	130
10-14	All Thumbs Garden Club	15
10-18	Rotary Club	95
12-11	Jackson Co. Rock & Fossil Club	35
12-21	Dudleytown Conservation Club	40

V. Public Relations

E. Refuge Tours

Date	Organization	Number Attending
1-13	Congressman Hamilton and Admnis. Assistant, McFall	2
1-16	Ball State University Wildlife Class and Dr. Ralph Kirkpatrick	13
2-17	Public Service Co. personnel	3
2-18	Recreation Committee, Seymour Chamber of Commerce	15
2-27	Cincinnati Zoological Society	24
3-2	James Harrison, Central States Fisheries Station	1
3-24	George Tilford, sports writer, Indianapolis Star	1
3-26	Art Reddinger, County Extension Youth Agent	1
4-17	Girl Scouts & Leaders	16
4-20	6th Grade Class	60
4-24	Girl Scouts	13
4-24	Girl Scouts	17
4-27	2nd and 3rd Grade Class & Teachers	60
4-30	Girl Scouts	14
5-4	Cub Scouts	13
5-7	Senior Citizens - Jennings Co.	20
5-9	Short Ridge High School students	15
5-14	Frank Hughes & class of elementary teachers from Indiana University	22
5-17	2nd graders and parents	40
5-18	Kindergarten class & supervisors	68
5-19	1st & 3rd graders & supervisors	66
5-21	3rd & 4th graders & supervisors	84
5-24	Interested visitors	15
5-26	Cub Scouts & Leaders	14
6-3	Jim Peterson, Indiana & Purdue Univ.	1
6-10	Retarded children from Muscatatuck State Hospital	50
6-17	Church group	108
6-17	Church group	17
6-17	Retarded children from Muscatatuck State Hospital	28
6-23	Church group	125

Date	Organization	Number Attending
6-24	4-H Group and Leaders	11
6-25	4-H Group & Leaders	35
7-7	Girls Club members and leaders	20
7-8	Retarded children from Muscatatuck State Hospital	50
7-12	4-H Field Day	56
7-15	Youth Conservation Corp Camp -girls	18
7-15	Retarded children from Muscatatuck State Hospital	50
7-17	Boy Scouts	12
7-20	Hunter Blanco, Chairman, Seymour Chamber of Commerce, Recreation Committee	1
7-21	4-H Youths & Leader	16
7-29	Retarded children from Muscatatuck State Hospital	50
7-29	Youth Conservation Corp Camp -girls	13
8-9	Bob Norrell, Scoutmaster	1
8-12	Retarded children from Muscatatuck State Hospital	50
8-19	Retarded children from Muscatatuck State Hospital	50
9-12	Interested visitors	10
9-30	3rd Grade class - Redding School	68
10-7	Advisory Council to Bureau of Lands, Forest & Wildlife Resources	13
10-7	Girl Scouts & Leaders	31
10-19	Wayne School - 5th Graders	31
10-26	Brownies & Leaders	24
10-31	Interested visitors	20
11-2	Cub Scouts & Leaders	18
11-3	Henry Horstman, S.C.S. and Charles Yeager, Co. Extension Agent	2
11-3	Kindergarten class & teachers	62
11-16	Brownies & Leaders	27
11-20	Girl Scouts & Leaders	23
11-22	Jim Hunt, State Board of Health and Hubert Caldwell, Jennings Co. Sanitarian	2
12-30	Joe Lamendola, Waterfowl biologist	1

F. Hunting

The quail and rabbit season opened November 20 and remained open until December 31 for quail and January 31 for rabbit. The season and the daily bag limits of 10 quail and 5 rabbits were in keeping with the State of Indiana hunting regulations. An additional 320 acres were opened to public hunting in the Fall of 1971, making a total of 1,320 acres of suitable upland game habitat for the refuge hunter. Initial hunting success was good, with many hunters getting both quail and rabbit. After the first week of hunting, hunting success diminished and the number of hunters dropped. The total number of hunters increased from 650 hunters in 1970 to 2,400 hunters in 1971. Hunting of all other forms of wildlife on the refuge is prohibited.

G. Violations

We continue to have problems with dumping of trash and raccoon hunting on refuge lands. After land acquisition is completed and some public access roads are closed, control of refuge land and visitors will become less of a problem. The cases listed below were made on or in the vicinity of the refuge during 1971. All of these cases were prosecuted in State Court:

Violator	Date	Offense	Disposition
Michael Root	2-19-71	Dumping trash	$21.00 fine
Steven Robinson	3-14-71	Dumping trash	30.00 fine
Donald Matney	4-15-71	Dumping trash	23.25 fine
Donald Everhart	10-30-71	Shooting waterfowl from motorboat	26.00 fine
Felix Woods	10-30-71	Shooting waterfowl from motorboat	26.00 fine
Walter Campbell	12-6-71	Hunting raccoon	26.00 fine
Merrill Stewart	12-6-71	Hunting raccoon	26.00 fine

VI. Other Items

A. Items of Interest

Honorable Lee H. Hamilton, Ninth District Congressman, visited the Muscatatuck National Wildlife Refuge in January to familiarize himself with refuge progress. Congressman Hamilton is very concerned with the planning and development of the refuge.

A $195,000 appropriation for Muscatatuck National Wildlife Refuge was passed by the House of Representatives in July. The appropriation was omitted in the Senate. Congressman Hamilton re-submitted a new request, and this supplemental appropriation for $100,000 was again approved by the House of Representatives and passed by the Senate. The money had not been released by the Office of Management and Budget as of January 1, 1972. A majority of this money will be spent on master planning, with the remainder being spent on beginning development.

The Refuge Manager was appointed to the Indiana State Advisory Committee on Outdoor Recreation in August.

B. Photographs

Photographs are placed in the text, as applicable, with additional photographs appended.

SIGNATURE PAGE

Submitted by:

Charles L. Scheffe
(Signature) Charles L. Scheffe

Refuge Manager
(Title)

Date:_____

Approved, Regional Office:

Date: MAY 11 1972

James P. Gutman
(Signature)

ASST.
Regional Refuge Supervisor

"Do you have a shorter pole?" This youngster was out to catch a trophy during one of our fishing contests.

"Wood ducks are the major nesting waterfowl on the refuge. Wood duck broods have shown good utilization of Mini Marsh and North Shorebird Marsh."

"Many wildlife observers enjoy watching our display flock of mallards. Their daily presence provides a living experience for the numerous conducted tours provided by refuge personnel."

"Local support of refuge development is a primary concern. The good will promoted by a family fishing outing will help smooth out future problems."

"Moss Lake has long been the site of a wood duck roost, although several other marshes built by the refuge appear to be developing into roosts. If a large impoundment is constructed, Moss Lake will form the main pool.

3-1750
Form No. 2
(Rev. March 1953)

WATERFOWL

REFUGE Muscatatuck NWR

MONTHS OF January 1 TO April 31, 1971

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	3	3	3	3	3					
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	80	150	200	300	300	300	200	100	50	300
Black	8	30	40	60	60	60	30	20	20	100
Gadwall										
Baldpate	5							5		6
Pintail	6	10	10	10	10	10	10	10	10	60
Green-winged teal								2	2	
Blue-winged teal										
Cinnamon teal										
Shoveler	5	6	6	6	6	6	6	6	6	10
Wood		1	1				1	2	2	10
Redhead										
Ring-necked										1
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coot:										

Int. Dup. Sec., Wash., D.C. 37944

3-1770a
Con NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Muscatatuck NWR MONTHS OF January 1 TO April 30, 1971

(1) Species	(2) Weeks of reporting period 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production Broods: seen	Broods: Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada		4							133		
Cackling											
Brant											
White-fronted											
Snow		10	25	25	40				595		
Blue		7	30	30	50				819		
Other											
Ducks:											
Mallard	500	600	500	400	100				27,167		
Black	150	150	100	100	20				6,536		
Gadwall	6	20	20	4					350		
Baldpate	100	200	200	150	50	50			5,362		
Pintail	100	100	50	25					2,947		
Green-winged teal	10	20	30	40					728		
Blue-winged teal	40	200	200	300	400	700	300		14,894		
Cinnamon teal											
Shoveler	25	30	30	30	3	20	10		1,477		
Wood	150	150	150	200	300	400	500		13,069		
Redhead		2	2						28		
Ring-necked	20	100	100	30	10				1,827		
Canvasback											
Scaup		100	100	20					1,540		
Goldeneye					10				70		
Bufflehead	1	1	1						21		
Ruddy											
Other Hooded Merganser		2	2	2	2	2	2		84		
Coots:				60	100	100	50		2,170		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	1,547	55	0
Ducks	76,180	1,675	0
Coots	2,170	100	0

SUMMARY

Principal feeding areas **Flooded millet in the shore bird area**

Principal nesting areas

Reported by

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1750
Form 1
(Rev. March 1953)

WATERFOWL

REFUGE Muscatatuck NWR

MONTHS OF May 1 TO August 31, 19 71

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada										
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard										
Black										
Gadwall										
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal	200	100	100	20	10	10				
Cinnamon teal										
Shoveler										
Wood	550	550	550	575	100	620	650	650	700	700
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coot:	50	50	30	3	3					

Int. Dup. Sec., Wash., D.C. 37944

3-1770a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Muscatatuck NWR MONTHS OF May 1 TO August 31, 1971

(1) Species	(2) Weeks of reporting period 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production Broods seen	(4) Production Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada											
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard									1152	0	
Black											
Gadwall											
Baldpate											
Pintail											
Green-winged teal											
Blue-winged teal					3	3	6		3305	0	
Cinnamon teal											
Shoveler											
Wood	700	700	700	700	700	700	700		77,335	30	50
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coots:									952	0	

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese			
Ducks	82,791	750	300
Coots	952	50	0

SUMMARY

Principal feeding areas Mini-Marsh

Principal nesting areas Along Muttom and Storm Creek

Reported by

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1750
Form N1
(Rev. March 1953)

WATERFOWL

REFUGE Muscatatuck NWR

MONTHS OF Sept. 1 TO Dec. 31, 1971

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada				6	16	16	37	37		
Cackling										
Brant										
White-fronted										
Snow										
Blue								2	2	2
Other										
Ducks:										
Mallard	3	40	40	50	50	80	100	110	130	180
Black			6	6	10	12	15	15	20	30
Gadwall										
Baldpate					6	10	20	20	25	40
Pintail						4	4	4	4	10
Green-winged teal			10	5	15	10	10	10	10	15
Blue-winged teal	12	80	90	70	60	70	70	70	60	15
Cinnamon teal										
Shoveler				4	4	6	6	6	6	6
Wood	650	650	600	600	600	600	500	500	500	400
Redhead										
Ring-necked										15
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coot:			20	20	20	20	25	30	40	50

Int. Dup. Sec., Wash., D.C. 37944

3-17[illegible]a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Muscatatuck NWR

MONTHS OF September 1 TO December 31, 1971

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production	
	11	12	13	14	15	16	17	18		Broods seen	Estimated total
Swans:											
Whistling		14	14	14	8	8	8	8	518		
Trumpeter											
Geese:											
Canada	1	1	1	1	1	1	1	1	840		
Cackling											
Brant											
White-fronted											
Snow											
Blue	2	2	2	2	2	2	2	2	154		
Other											
Ducks:											
Mallard	180	250	250	350	350	350	350	400	22,834		
Black	30	60	60	75	75	75	75	100	4,634		
Gadwall	10	20	20	30	20	10	10	10	1,036		
Baldpate	50	75	75	50	50	20	20	10	3,297		
Pintail	20	25	25	10	10				812		
Green-winged teal	10	10	10	50	30				1,330		
Blue-winged teal	10								4,249		
Cinnamon teal											
Shoveler									266		
Wood	400	400	400	400	200	150	150	50	54,250		
Redhead	12								84		
Ring-necked									105		
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coots:	50	50	50	20	20	10	10	10	3,135		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	518	14	0
Geese	994	37	0
Ducks	92,897	965	0
Coots	3,135	50	0

SUMMARY

Principal feeding areas ~~Shorebird areas~~

Principal nesting areas

Reported by

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Muscatatuck NWR Months of January 1 to April 30 1971

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Sand hill cranes	2	2-24-71	63	2-28-71	36	3-29-71				120
American egret	1	4-1-71	1	4-1-71	1	4-1-71				1
Little blue heron	1	4-25-71	2	4-28-71	1	4-30-71				4
Green heron	1	4-28-71	10	4-30-71	10	4-30-71				25
II. Shorebirds, Gulls and Terns:										
Killdeer	1	2-5-71	15	4-10-71	2	4-30-71				250
Wilson snipe	12	4-1-71	30	4-18-71	1	4-30-71				300
Woodcock	1	4-10-71	1	4-10-71	1	4-10-71				75

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:										
Mourning dove	100	1-1-71	300	3-20-71	50	4-30-71				8,000
White-winged dove										
IV. Predaceous Birds:										
Golden eagle										
Duck hawk										
Horned owl										
Magpie										
Raven										
Crow	18	1-5-71	20	3-1-71	2	4-30-71				250

Reported by.....

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) al: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1751
Form NR-1a
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Muscatatuck NWR Months of May 1 to August 31 1971

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Common Gallinule	1	5-9-71	1	5-9-71	1	5-9-71		0	0	1
Yellow Crowned Night Heron	2	5-10-71	2	8-12-71	2	8-12-71		0	0	2
Black Crowned Night Heron	1	5-11-71	1	5-11-71	1	5-11-71		0	0	1
Great Blue Heron	1	5-3-71	5	7-29-71	2	8-31-71		0	0	7
Little Blue Heron	1	6-1-71	4	7-15-71	1	8-20-71		0	0	8
Green Heron	1	5-3-71	30	7-21-71	5	8-29-71		20	40	80
II. Shorebirds, Gulls and Terns:										
Sora Rail	1	5-10-71	4	7-8-71	2	8-20-71		0	0	30
Killdeer	1	5-1-71	100	7-9-71	2	9-29-71		100	200	400
Woodcock	1	5-8-71	1	5-8-71	1	5-8-71		0	0	10
Spotted Sandpiper	1	6-3-71	12	7-10-71	1	8-25-71		10	20	50
Pectoral Sandpiper	20	8-17-71	20	8-17-71	20	8-17-71		0	0	60
Wilson Snipe	6	8-28-71	6	8-28-71	6	8-28-71		0	0	21

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:										
Mourning dove	10	5-1-71	300	6=25-71	20	8-19-71		1100	2000	5000
White-winged dove										
IV. Predaceous Birds:										
Golden eagle										
Duck hawk										
Horned owl										25
Magpie										
Raven										
Crow	1	5-1-71	20	6-19-71	2	8-29-71		10	20	50

Reported by.....

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) [illegible]al: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1751
Form NR-___
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Muscatatuck NWR Months of September 1 to December 31 1971

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Sandhill cranes	26	11-5-71	250	12-4-71	65	12-17-71		0	0	400
American egret	1	9-17-71	1	9-17-71	1	9-17-71		0	0	1
Green Heron	5	9-4-71	25	9-27-71	1	10-1-71		0	0	80
Great Blue Heron	4	1-5-71	5	9-21-71	1	12-16-71		0	0	5
II. Shorebirds, Gulls and Terns:										
Wilson Snipe	12	9-22-71	12	9-22-71	1	12-17-71		0	0	350
Sora Rail	1	9-15-71	1	9-15-71	1	9-15-71		0	0	30
Greater yellowlegs	8	9-22-71	30	9-29-71	30	9-29-71		0	0	60
Herring gull	1	9-18-71	1	9-18-71	1	9-18-71		0	0	1
Kill deer	10	9-2-71	35	10-15-71	2	12-1-71		0	0	250

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:										
Mourning dove	10	9-2-71	300	11-5-71	20	12-29-71	0	0	0	8,000
White-winged dove										
IV. Predaceous Birds:										
Golden eagle										
Duck hawk										
Horned owl	1	12-10-71	1	12-10-71	1	12-10-71	0	0	0	30
Magpie										
Raven										
Crow	1	9-6-71	30	11-10-71	6	12-30-71	0	0	0	200

Reported by.....

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1750c
Form NR
(Sept. 1950)

Waterfowl Hunter Kill Survey

Refuge [illegible]

Year 1970 71

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est.No. Hunters	(9) Est. Total Kill
			(THIS REFUGE IS CLOSED TO WATERFOWL HUNTING)					

(over)

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Muscatatuck NWR Months of January 1 to April 30, 1971

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob White Quail	New habitat has been acquired, but has not been catagorized	6½	0	0	No census	0	0	0	300	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts,etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Muscatatuck NWR Months of May 1 to August 31, 1971

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob White Quail	New habitat has been acquired, but has not been catagorized	6½	3	35		0	0	0	425	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts,etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge ~~Muscatatuck NWR~~ Months of Sept. 1 to Dec. 31, 19 71

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob White Quail	6,000 acres of forest edge green legume agricultural fields and reverting agricultural lands		not enough data				NA	NA	400	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts,etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1 3
Form NR-3
(June 1945)

BIG GAME

Refuge Muscatatuck NWR Calendar Year 1971

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White tail deer	6,000 wood bottomland and upland hardwood	30	NA	NA	NA	NA	Not enough data			NA		120	120	

Remarks: Survey method, casual observations and hikes over snow observed tracks.

Reported by _____

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-17.
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Muscatatuck NWR Year ending April 30, 1971

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5) Total Population
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
Cottontail Rabbit	New habitat has been acquired, but has not been catagorized	3½	0	0	0	0	0	0	0					700

* List removals by Predator Animal Hunter

REMARKS:

Reported by _____

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

32715

3-17[illegible]
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Muscatatuck NWR Year ending April 30, 1971

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5) Total Population
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
Cottontail Rabbit	New habitat has been acquired, but has not been catagorized	3½	60	0	0	0	0	0	0	0	0	0	0	900

* List removals by Predator Animal Hunter

REMARKS:

Reported by _____

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

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(5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

32/15

3-1
Form NR-5

DISEASE

Refuge Muscatatuck NWR Year 19 71

Botulism

Period of outbreak _____

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Condition of vegetation and invertebrate life _____

Remarks ~~No disease was observed~~

Lead Poisoning or other Disease

Kind of disease _____

Species affected _____

Number Affected Species	Actual Count	Estimated

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

INT.-DUP., D.C.- 53818-59

(1)

3-1757
Form NR-7
(Rev. June 1960)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge Muscatatuck Year 1971

	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
Species	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Los

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Total acreage planted:
Marsh and aquatic _____
Hedgerows, cover patches _____
Food strips, food patches _____
Forest plantings _____

Remarks: No charge was made for collecting mushrooms, persimmons or nuts. The public was given full access for this purpose. None of the above were collected for storage by refuge personnel.

3-17[illegible]
Form A-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Muscatatuck NWR County Jackson State Indiana

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return Harvested		Government's Share or Return Unharvested		Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Acres	Bu./ Tons	Acres	Bu. /Tons			
Eggeman corn	63		9				72	Grass Legume	18
Ray corn	31		10				41		
Hoevner corn	40						40	Grain Sorghum	20
Kent corn	30				2		32	Grass Legume	28
Lenz corn	45		15				60		
McDonald corn	15		5				20		
Maschino,L. corn	20						20		
Taskey corn	15		5				20		
								Fallow Ag. Land.	1,000

No. of Permittees: Agricultural Operations 8 Haying Operations none Grazing Operations none

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
None				1. Cattle	None			
				2. Other	None			
				1. Total Refuge Acreage Under Cultivation				361
Hay - Wild				2. Acreage Cultivated as Service Operation				10

DIRECTIONS FOR PREPARING FORM NR--8'
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only thenumber of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvesed column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops Specify the acreage kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting

Total Refuge Acreage Under Cultivation Report total land area devoted to agricultural purposes during the year.

3-17[illegible]
Form [illegible]-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Muscatatuck County Jennings State Indiana

Cultivated Crops Grown		Permittee's Share Harvested		Government's Share or Return Harvested		Government's Share or Return Unharvested		Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
		Acres	Bu./Tons	Acres	Bu./ Tons	Acres	Bu. /Tons			
Ray	corn	55		18				73		
Maschino,G.	corn	48				2		50	Grass Legume	20
Juett	corn	9		3				12		
Kent	corn	30						30	Grass Legume	25
Large	corn	12				6		18		
Maschino,L.	corn	26						26	Grass Legume	23
Kasting	corn	36						36	Grass Legume	18
Monroe Gr.	Sorghum	21				11		32	Grass Legume	10
Trilling	corn	20						20		
									Fallow Ag. Land.	500

No. of Permittees: Agricultural Operations 9 Haying Operations None Grazing Operations None

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
None				1. Cattle	None			
				2. Other	None			
				1. Total Refuge Acreage Under Cultivation				393
Hay - Wild				2. Acreage Cultivated as Service Operation				5

DIRECTIONS FOR PREPARING FORM NR--8'
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only thenumber of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvesed column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops Specify the acreage kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting

Total Refuge Acreage Under Cultivation Report total land area devoted to agricultural purposes during the year.

3-1570
NR-8a
(4/54)

REFUGE GRAIN REPORT

Refuge Muscatatuck NWR Months of January through December, 1971

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Yellow Dent Corn	200	4,250	4,450 bu			2,500	2,500	1.950 Bu		1,950	000

(8) Indicate shipping or collection points NA

(9) Grain is stored at Grain storage areas located around the Refuge

(10) Remarks

*See instructions on back.

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.–DUP. SEC., WASH., D.C. 17065

3-176
Form NR-11
(2/46)

TIMBER REMOVAL

Refuge Muscatatuck NWR Year 1971

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
ALL OF THE TIMBER REMOVED FROM THE MUSCATATUCK NWR DURING 1971 WAS FROM PRIVATE IN-HOLDINGS OR THAT TIMBER WHICH HAD BEEN RESERVED BY THE AGREEMENT FOR PURCHASE WITH A FORMER LAND OWNER.								

Total acreage cut over N/A Total income none

No. of units removed B. F. Method of slash disposal
Cords
Ties

INT.-DUP. SEC., WASH., D.C. 36103

3-1979 (* 12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PESTICIDE APPLICATION

Refuge: Muscatatuck

Proposal Number: none

Reporting Year: 1971

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		NO PESTICIDES WERE USED ON THE MUSCATATUCK NWR DURING 1971						

Charles E. Scheffe

Charles E. Scheffe, Refuge Manager

10. Summary of results (continue on reverse side, if necessary)

35501